STATE OF CALIFORNIA - HEALTH AND HUMAN SERVICES AGENCY
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June 1, 2005

Dear AAA Directors, Dietitians, and Providers;

This letter is to summarize new requirements for Older Americans Act nutrition services, and to solicit feedback on statewide policy approaches.

In accordance with the Older Americans Act the Elderly Nutrition Programs (ENP) must comply with the current 2005, *Dietary Guidelines*, [Section 339. (2) (A) (i)]. The *Dietary Guidelines for Americans* is published jointly every 5 years by the Department of Health and Human Services (HHS) and the Department of Agriculture (USDA). The 2005, *Dietary Guidelines* were released in January. Implementation of the key recommendations that impact Older Californians health status should be integrated into the ENPs' menu planning. Attached are the **proposed** standards that will impact the Elderly Nutrition Programs menu requirements.

Chronic diseases are the leading cause of death in older Californians. In 2000 the top three causes of death for seniors were heart disease, cancer, and stroke. These killers are often preventable, poor health is not an inevitable consequence of aging. A healthy diet, regular physical activity and a smoke free environment can reduce the risk of the leading causes of death.

The *2005, Dietary Guidelines* is based on the latest scientific information. The *Guidelines* provide authoritative advice for people two years and older about how good dietary habits can promote health and reduce risk for major chronic diseases. The new *Guidelines* consider age as a factor in nutrition requirements; this change has the greatest impact on the nutrient requirements of the old and the young. The *Dietary Guidelines* have changed from a recommendation of five servings of fruits and vegetables a day to nine servings. This will require each ENP meal to provide three servings of fruits and vegetables per meal. We recognize that increasing the number of servings per meal, especially for the elderly, may contribute to food waste. The alternative to strict adherence to the three servings per meal is to adopt a nutrient analysis approach to meal planning, as explained below.

In order to comply with these new requirements, programs will have to design menus using either the new meal pattern model (to meet the three servings per meal requirement) or adopt a computerized nutrient analysis approach for each meal served. The meal pattern model would require an increase in the amount of food (three servings total of fruits and vegetables and two servings of grains, at least one of which must be whole grain) in each meal to ensure the nutrient requirements have been met.

The use of computerized analysis will ensure the levels of nutrients in the meals meet requirements, without strict adherence to the three servings per meal requirement.

The Dietary Guidelines are intended to aid policy makers in designing and implementing nutrition related programs. The nutritionists who are developing menus must also be mindful that many seniors are unable to eat large quantities of food; it is not the goal of these guidelines to create plate-waste. The ENP will not be able to meet the ideal nutrient requirements for all nutrients (to avoid plate waste), but CDA encourages every attempt to include the key nutrients that impact the health status of Older Californians included in the attached memo.

CDA will be soliciting input from stakeholders as we move to comply with the current *Dietary Guidelines*. Please send your comments to Barbara Estrada at (916) 323-1123 or Dalna McKeon at (916) 324-3451.

Sincerely,

R. E. Ramsey-Lewis

Robert Ramsey-Lewis, Policy Manager
Team A

Attachment

SUBJECT: California Elderly Nutrition Program Menu Standards

TO: Area Agency on Aging Directors

FROM:

PURPOSE: To **solicit input from stakeholders** on an update to the Title 22 Nutrition Requirements for meals and provide menu standards to comply with the 2005 Dietary Guidelines for Americans.

LEGISLATIVE REFERENCE: Older Americans' Act of 1965, as amended 2000, Sec 339
Title 22, Division 1.8, Chapter 4, Article 6, Section 7638.5

BACKGROUND: The California Department of Aging established nutrition requirements for the Elderly Nutrition Program (ENP) in Title 22 which included menu standards to aide in the provision of safe and nutritious meals and meet the requirements of the Older Americans Act.

SPECIAL INSTRUCTIONS: The ENP Menu Standards are used for the planning and procuring of meals. They shall be followed in all meals funded with Older Americans Act Title III and Nutrition Services Incentive Program (NSIP) funds, State funds and program income.

The standards shall be tested by the providers during the contract period, beginning July 1, 2005 through June 30, 2006. Changes to the new menu standards will be implemented based on the responses of all AAAs. These changes will be effective beginning with the contract year July 1, 2006.

Please offer your responses by January 1, 2006.

MENU STANDARDS

Purpose

Menu standards are developed to sustain and improve client health through the provision of safe and nutritious meals using specific guidelines. These guidelines shall be incorporated into all requests for proposals/bids, contracts and open solicitations for meals.

The recommendations contained within the Dietary Guidelines are targeted to the general public over 2 years of age who are living in the United States. Because of its focus on health promotion and risk reduction, the Dietary Guidelines form the basis of federal food, nutrition education, and information programs.

The Food and Nutrition Board of the National Academy of Sciences, beginning in the early 1990s, undertook the task of revising the RDAs and new nutrient reference values were developed called the Dietary Reference Intakes (DRIs). There are four types of DRI reference values: the Estimated Average Requirement (EAR), the Recommended Dietary Allowance (RDA), the Adequate Intake (AI) and the Tolerable Upper Intake Level (UL) *see definitions*. The primary goal of having new dietary reference values was not only to prevent nutrient deficiencies but also reduce the risk of chronic diseases such as osteoporosis, cancer, and cardiovascular disease. The development of the new federal guidelines impacts the standards to which the Elderly Nutrition Program is being held.

Definitions

1. Dietary Reference Intakes

- Recommended Dietary Allowance (RDA): the average daily dietary intake level that is sufficient to meet the nutrient requirement of nearly all (97 to 98 percent) healthy individuals in a particular life stage and gender group.
- Adequate Intake (AI): a recommended intake value based on observed or experimentally determined approximations or estimates of nutrient intake by a group (or groups) of healthy people that are assumed to be adequate – used when an RDA cannot be determined.
- Tolerable Upper Intake Level (UL): the highest level of daily nutrient intake that is likely to pose no risk of adverse health effects for almost all individuals in the general population. As intake increase above the UL, the potential risk of adverse effects increases.
- Estimated Average Requirement (EAR): a daily nutrient intake value that is estimated to meet the requirement of half of the healthy individuals in a life stage and gender group – used to assess dietary adequacy and as the basis for the RDA.

Authorizing Documentation

The Older Americans Act of 1965, as revised in 2000, requires that meals

1. comply with the Dietary Guidelines for Americans, published by the Secretary of Health and Human Services and the Secretary of Agriculture,
2. provide to each participating older individual:
    a. a minimum of 33 1/3 percent of the recommended dietary allowances as established by the Food and Nutrition Board of the Institute of Medicine of the National Academy of Sciences, if the project provides one meal per day,
    b. a minimum of 66 2/3 percent of the allowances if the project provides 2 meals per day,
    c. 100 percent of the allowances if the project provides 3 meals per day, and
3. to the maximum extent practicable, are adjusted to meet any special dietary needs of program participants.

The Older Americans Act requires Elderly Nutrition Programs to comply with the current Dietary Guidelines. A significant amount of the new scientific information used by the Dietary Guidelines Advisory Committee to develop the new Dietary Guidelines was based on the Dietary Reference Intakes. The DRIs are considered the latest scientific standard established for nutrition requirements. Though the OAA does not specify the DRIs (they in fact specify the RDAs) it is understood that any new standards supersede previous ones.

2005 Dietary Guidelines

The Dietary Guidelines for Americans 2005 recommendations are:

1. Consume adequate nutrients within calorie needs –
    - ✓ Consume a variety of nutrient-dense foods and beverages within the basic food groups. Choosing foods that limit the intake of saturated and trans-fats, cholesterol, added sugars, salt, and alcohol.
    - ✓ Meet recommended intakes within energy needs by adopting a balanced eating pattern.
2. Weight management
    - ✓ To maintain body weight in a healthy range, balance calories from foods and beverages with calories expended.
    - ✓ To prevent gradual weight gain over time, make small decreases in food and beverage calories and increase physical activity.
3. Physical activity
    - ✓ Be physically active each day.

4. Food groups to encourage
    - ✓ Consume a sufficient amount of fruits and vegetables while staying within energy needs. Two cups of fruit (4 servings) and two and one half cups of vegetables (5servings) per day are recommended for a 2,000 calorie per day intake.
    - ✓ Consume 6 or more servings of grain products per day – one half of these servings should be whole grain products.
    - ✓ Consume 3 or more cups per day of fat-free or low-fat milk or equivalent milk products.
5. Fats
    - ✓ Consume less than 10 percent of calories from saturated fatty acids and less than 300 mg/day of cholesterol, and keep trans-fatty acid consumption as low as possible.
    - ✓ Keep total fat intake between 20 to 35 percent of calories, with most fats coming from sources of polyunsaturated and monounsaturated fatty acids, such as fish, nuts, and vegetable oils.
    - ✓ Choose lean, low-fat, or fat free; meats, poultry, dry beans, and milk products
6. Carbohydrates
    - ✓ Choose fiber rich fruits, vegetables and whole grains often.
    - ✓ Choose and prepare foods and beverages with little added sugars.
7. Sodium and Potassium
    - ✓ Key recommendation for older adults; consume no more than 1,500 mg of sodium per day. (The recommendation for the general population is 2,300 mg/day; therefore the flexibility to average up to 800 mg/meal is allowed)
    - ✓ Choose and prepare foods with little salt.
    - ✓ Choose potassium rich foods such as fruits and vegetables. A potassium rich diet blunts the effect of salt on blood pressure, may reduce the risk of developing kidney stones, and possibly decrease bone loss with age.
8. Food Safety – To avoid microbial foodborne illness:
    - ✓ Clean hands, food contact surfaces, and fruits and vegetables. Meat and poultry need not be washed or rinsed.
    - ✓ Separate raw, cooked, and ready-to-eat foods while shopping, preparing, or storing foods.
    - ✓ Cook foods to a safe temperature to kill microorganisms.
    - ✓ Chill (refrigerate) perishable food promptly and defrost foods properly.

- ✓ Avoid raw (unpasteurized milk or any products made from unpasteurized milk raw or partially cooked eggs or foods containing raw eggs, raw or undercooked meat and poultry, unpasteurized juices, and raw sprouts.

Key Recommendations for Older Adults:

- ✓ Consume extra vitamin D from vitamin D-fortified foods.
- ✓ Consume no more than 1,500 mg of sodium per day, and meet the potassium recommendation (4,700 mg) with food.
- ✓ Participate in regular physical activity to reduce functional declines associated with aging and to achieve the other benefits of physical activity identified for all adults.
- ✓ Consume B12 in its crystalline form – from fortified foods or supplements

The *Dietary Guidelines* are intended to aid policy makers in designing and implementing nutrition related programs. The nutritionists who are developing menus must also be mindful that many seniors are unable to eat large quantities of food; it is not the goal of these guidelines to create plate-waste. The ENP will not be able to meet the ideal nutrient requirements for all nutrients (to avoid plate waste) but CDA encourages every attempt to include the key nutrients that impact the health status of Older Californians such as:

- ✓ Fiber
- ✓ Protein
- ✓ Calcium
- ✓ Vitamin B-6
- ✓ Fat
- ✓ Vitamin B-12
- ✓ Zinc
- ✓ Magnesium
- ✓ Vitamin C
- ✓ Vitamin A

Chronic diseases are the leading cause of death in older Californians. In 2002 the top three causes of death for seniors in California were heart disease, cancer, and stroke. These killers are often preventable, poor health is not an inevitable consequence of aging. A healthy diet, regular physical activity and a smoke free environment can reduce the risk of the leading causes of death.

California Department of Aging encourages every attempt to include the key nutrients and recommendations that impact chronic disease in Older Californians when developing menus for the ENPs. CDA also acknowledges that the number of variables impacts the ability to fulfill all nutrient requirements. Computer analysis will provide better information about the menus than a meal pattern and may decrease food cost.

Nutrition Education

Recognizing that the Older Americans Act does not allow for supplement use, CDA recommends Nutrition Education programs for the nutrient elements that impact older Californians health status but will be difficult to include in the menus, such as; Vitamin D, E, and B-12.

Documentation Procedure

Each AAA is responsible for ensuring that meals served by nutrition service providers meet the requirements in this part. The nutritional value of menus shall be confirmed either by (1) nutritional analysis or (2) the new meal pattern. All menus must be approved by a Registered Dietitian (RD) prior to implementation. All records of approved menus should be kept until monitored by the Department.

Nutrient Requirements and Values for Analysis

The table below represents the most current DRIs that include the RDA and AI nutrient values for use when planning and evaluating meals. Values are provided for one meal a day for the average older adult population served by the program. For serving two meals a day, the values in the compliance range must be doubled, and for three meals per day, the values are tripled.
The nutrients selected are based on the target nutrients to:

- ✓ Promote health and prevent disease
- ✓ Prevent deficiencies
- ✓ Indicate Diet Quality
- ✓ Manage disease

Consideration was also given to the Mathematica study data indicating ENPs were not meeting 1/3 of the DRIs for certain nutritional elements. Sodium was liberalized based on the information from this study that demonstrates that for many participants the meal provides close to 40-50% of the participants daily intake.

Nutrient	Target Value * per meal	Compliance Range **
Calories (Kcal)	>685	>600
Protein (% of Total Calories)	18-21 gr	18-21 grams
Fat (% of Total Calories	30%	<35% weekly average
Vitamin A (ug)	300 ug	> 300 ug 3 out of 5 days /wk or 4 out of 7 days/wk
Vitamin C (mg)	30 mg	30 mg
Vitamin B6 (mg)	0.57 mg	>0.57 mg
Vitamin B12 (ug)	0.79 ug	0.79 ug
Calcium (mg)	400 mg	>400 mg
Magnesium (ug)	140 mg	>117 mg
Zinc (mg)	3.1 mg	>3.1 mg
Sodium (mg)	<800 mg	<1,000 mg **
Fiber (gm)	>10 gm	>7 gm

*Target Value: This value represents one-third the Dietary Reference Intake.

** Compliance Range: This range represents acceptable minimum or maximum values as specified by the State. To allow for menu flexibility and client satisfaction.

NOTE: Fortified foods should be used to meet vitamin B12 needs. Vitamin A content should be from vegetable (carotenoid) sources.

Meal Requirements

Consider a variety of food and preparation methods; food combinations and attributes including color, texture, size, shape, taste, and appearance when menu planning.

All regular menus whether prepared on site, frozen, non-perishable, boxed lunch, or catered must meet the same requirements in these specifications.

Meal Pattern

Meal patterns should be used as a planning tool to ensure food plate coverage and the appropriate types and amounts of foods are served. Use of computerized nutrient analysis will help ensure nutritional adequacy of meals. The AAA has some discretion to allow flexibility in planning meals that may not meet the meal pattern but do meet the nutrient value requirements. Fortified food products and combination dishes used in a menu may not match the meal pattern but may provide for the required nutrient values. For example, a fortified snack bar as a dessert could be used to boost the nutrient value of a boxed lunch or special occasion meal.

The meal pattern below is based on the newer DRIs for energy; it provides approximately 685 calories per meal. This updated meal pattern includes one additional serving of bread or bread alternate and another serving of vegetable or fruit compared to the 1992 meal pattern. Serving sizes are based on the *Food Guide Pyramid*. This updated sample meal pattern, does not assure that meals meet 1/3 the DRIs and the *2005 Dietary Guidelines*. Meals are likely to require specific types of fruits and vegetables, whole grains, and high fiber foods in order to assure the key nutrients are met. The updated meal pattern may be deficient in vitamin E, requiring nutrition education in the selection of foods that are good sources of this nutrient.

Food Group	**Servings per meal**(1,2)	*2005 Dietary Guidelines* **Servings per day for 2000 Kcal/day** *(2)*
Bread or Bread Alternate	2 servings	6 1-ounce equivalent servings daily. One half of grain servings should be whole grain products.
Vegetable	2-3 serving(s): ½ cup or equivalent measure (may serve an additional vegetable instead of 2 fruits)	5 servings daily. Include dark-green leafy; or orange vegetables, cooked dry peas and beans.
Fruit	1-2 servings: ½ cup or equivalent measure (may serve an additional fruit instead of 3 vegetables)	4 servings daily. Include deeply colored such as orange fruits.
Milk or Milk Alternate	1 serving: 1 cup or equivalent measure	3 servings daily, select low fat products
Meat or Meat Alternate	1 serving: 3 oz or equivalent measure	2 servings daily, total of 5.5 ounces
Fats	1 serving: 1 teaspoon or equivalent measure	2-3 Servings per day. Select foods lower in fat, saturated fat, and cholesterol, avoid trans-fats
Dessert	Varies	Select foods high in whole grains, low in fat and sugars
Sodium	< 800 mg	Select and prepare foods with less salt or sodium

(1) The number of servings per meal estimates provision of 1/3 of the DRIs.
(2) Caloric value (2,000 Kcal/day) based on a 51+ year old male, "low active" physical activity level Using Table 3. Estimated Caloric Requirements in Each Gender and Age Group at Three Levels of Physical Activity, from the Dietary Guidelines for Americans, 2005.
(3) The caloric requirement for women 51+ years is 1,600 Kcal/day. *2005 Dietary Guidelines*

Meal Components

Meat, Fish, Poultry, Legumes, Eggs and Cheese

The meal shall contain a 3-ounce cooked, edible portion of meat, fish, poultry, eggs, or cheese, providing at least 17 grams of protein for one meal per day. Two-ounce portions may be served when 2 or 3 meals are served daily.

1. Limit use of salted foods or high sodium meats (e.g. hot dogs, sausage, bacon, ham, cold cuts, etc) to no more than:
    - 1 time per month for 1 meal per day
    - 2 times per month for 2 meals per day.

    If high sodium meats are served more than once per month for **variety and client satisfaction**, then low sodium versions should be used when available and documented.

2. Serve legume dishes (using mature dried beans and peas and lentils, such as lima, kidney, navy, black, pinto or garbanzo beans, lentils, black eyed peas and soybeans) as often as possible in accordance with participant acceptance.

3. **Legume dishes may be used as a vegetable and a protein.**

4. Ground meat may be served no more than, two times per week.
   It does not include formed meat products or shredded meats.

5. Texturized Vegetable Protein (TVP) may be incorporated in recipes with a maximum ratio of 30% TVP to 70% meat.

6. Soups containing at least one-half cup of beans, lentils, or split peas may be counted as one ounce of meat.

Vegetables

1. Vegetables as a primary ingredient in soups, stews, casseroles or other combination dishes should total ½ cup per serving.
2. Lettuce and tomato served as condiments are not a vegetable serving.
3. **Legume dishes may be used as a vegetable and a protein.**

Fruit

A serving of fruit is generally:

- Medium whole fruit
- ½ cup fresh, chopped, cooked, frozen or canned, drained fruit
- ½ cup 100% fruit juice or cranberry juice

Fresh, frozen, or canned fruit must be packed in juice, light syrup or without sugar.

Grains/Starches

A variety of whole grain bread products should be consumed, particularly those high in fiber are recommended. Use whole grains (whole wheat, oats, brown rice, multi-grains), one half of the daily intake should be from whole grains.

Starchy vegetables: (serving size ½ cup)
Potatoes, sweet potatoes, corn, lima beans, yams, or plantains

Milk

Each meal shall contain eight ounces of fortified skim, 1% or buttermilk. If religious preference precludes the acceptance of milk with the meal, it may be omitted from the menu and an equivalent substitute must be used. (see Appendices)

Fat

Fats and oils are part of a healthful diet, but the type of fat makes a difference to heart health, and the total amount of fat consumed is also important.

- Consume less than 10 percent of calories from saturated fatty acids and less than 300 mg/day of cholesterol, and keep *trans* fatty acid consumption as low as possible.
- Keep total fat intake between 20 to 35 percent of calories, with most fats coming from sources of polyunsaturated and monounsaturated fatty acids, such as fish, nuts, and vegetable oils.
- When selecting and preparing meat, poultry, dry beans, and milk or milk products, make choices that are lean, low-fat, or fat-free.
- Limit intake of fats and oils high in saturated and/or *trans*-fatty acids, and choose products low in such fats and oils.

Fat is not a requirement. Each meal may contain fat components to increase the palatability and acceptability of the meal. Fat may be used in food preparation or served as an accompaniment to the meal.

Dessert

Dessert may be provided as an option to satisfy the caloric requirements or for additional nutrients. Desserts such as fruit, whole grains, low fat or low sugar products are encouraged.

1. When a dessert contains ½ cup of fruit per serving, it may be counted as a serving of fruit.
2. When a dessert contains the equivalent of 1 serving starches/grains per serving, it may be counted as a serving of starches/grains (example bread pudding).
3. When a dessert contains the equivalent of ½ cup milk per serving, it may be counted as ½ serving of milk.

Condiments and Product Substitutes

Salt substitutes shall not be provided. Sugar substitutes, pepper, herbal seasonings, lemon, vinegar, non-dairy coffee creamer, salt, and sugar may be provided, but shall not be counted as fulfilling any part of the nutritive requirements.

Shelf Stable Meals

Shelf stable meals shall be made available when feasible and appropriate. The shelf stable meals should be replenished, so the expiration date does not pass. Meals must follow the meal standards. The nutrient content of the meals in the package may be averaged to meet requirements.

Shelf Stable Meals Packaging Requirements:

- The package shall include menus to instruct the clients how to combine the foods to meet the meal requirements.
- Cans are to be easy to open, with pull tabs whenever possible.
- The box must be labeled with the use by/expiration date.

Modified Meals

Meals served according to the meal pattern are suitable for persons with diabetes, heart disease, and hypertension.

AAAs shall establish procedures that allow nutrition service providers to furnish modified meals where feasible, appropriate, and cost effective to meet the particular dietary needs that arise from religious or ethnic background or for health needs of the participants. Meals for participants who require therapeutic diets may be offered only when the modified meal can be obtained from a facility where a licensed dietitian-nutritionist approves the meals.

Supplements

Vitamin and/or mineral supplements shall not be provided. Medical foods and food for special dietary uses shall not be provided with federal or state nutrition funds. Title IIID and Medicaid waiver funds may be used for the provision of medical foods under certain circumstances, if specified in the Area Plan.

Food Sources of Vitamin A

Food Sources of Vitamin A ranked by micrograms Retinol Activity Equivalents (RAE) of vitamin A per standard amount; also calories in the standard amount. (1/3 RDA for adult men, is 300 ug/day RAE.)

Food, Standard Amount	Vitamin A (µg RAE)	Calories
Organ meats (liver, giblets), various, cooked, 3 oz[a]	1490-9126	134-235
Carrot juice, ¾ cup	1692	71
Sweet potato with peel, baked, 1 medium	1096	103
Pumpkin, canned, ½ cup	953	42
Carrots, cooked from fresh, ½ cup	671	27
Spinach, cooked from frozen, ½ cup	573	30
Collards, cooked from frozen, ½ cup	489	31
Kale, cooked from frozen, ½ cup	478	20
Mixed vegetables, canned, ½ cup	474	40
Turnip greens, cooked from frozen, ½ cup	441	24
Instant cooked cereals, fortified, prepared, 1 packet	285-376	75-97
Various ready-to-eat cereals, with added Vit. A, ~1 oz	180-376	100-117
Carrot, raw, 1 small	301	20
Beet greens, cooked, ½ cup	276	19
Winter squash, cooked, ½ cup	268	38
Dandelion greens, cooked, ½ cup	260	18
Cantaloupe, raw, ¼ medium melon	233	46
Mustard greens, cooked, ½ cup	221	11
Pickled herring, 3 oz	219	222
Red sweet pepper, cooked, ½ cup	186	19
Chinese cabbage, cooked, ½ cup	180	10

[a] High in cholesterol.

Source: Nutrient values from Agricultural Research Service (ARS) Nutrient Database for Standard Reference, Release 17. Foods are from ARS single nutrient reports, sorted in descending order by nutrient content in terms of common household measures. Food items and weights in the single nutrient reports are adapted from those in 2002 revision of USDA Home and Garden Bulletin No. 72, Nutritive Value of Foods. Mixed dishes and multiple preparations of the same food item have been omitted from this table.

Food Sources of Vitamin C

Food Sources of Vitamin C ranked by milligrams of vitamin C per standard amount; also calories in the standard amount. (RDA= 90 mg/day 1/3 RDA = 30 mg/day.)

Food, Standard Amount	Vitamin C (mg)	Calories
Guava, raw, ½ cup	188	56
Red sweet pepper, raw, ½cup	142	20
Red sweet pepper, cooked, ½ cup	116	19
Kiwi fruit, 1 medium	70	46
Orange, raw, 1 medium	70	62
Orange juice, ¾ cup	61-93	79-84
Green pepper, sweet, raw, ½ cup	60	15
Green pepper, sweet, cooked, ½ cup	51	19
Grapefruit juice, ¾ cup	50-70	71-86
Vegetable juice cocktail, ¾ cup	50	34
Strawberries, raw, ½ cup	49	27
Brussels sprouts, cooked, ½ cup	48	28
Cantaloupe, ¼ medium	47	51
Papaya, raw, ¼ medium	47	30
Kohlrabi, cooked, ½ cup	45	24
Broccoli, raw, ½ cup	39	15
Edible pod peas, cooked, ½ cup	38	34
Broccoli, cooked, ½ cup	37	26
Sweet potato, canned, ½ cup	34	116
Tomato juice, ¾ cup	33	31
Cauliflower, cooked, ½ cup	28	17
Pineapple, raw, ½ cup	28	37
Kale, cooked, ½ cup	27	18
Mango, ½ cup	23	54

Source: Nutrient values from Agricultural Research Service (ARS) Nutrient Database for Standard Reference, Release 17. Foods are from ARS single nutrient reports, sorted in descending order by nutrient content in terms of common household measures. Food items and weights in the single nutrient reports are adapted from those in 2002 revision of USDA Home and Garden Bulletin No. 72, Nutritive Value of Foods. Mixed dishes and multiple preparations of the same food item have been omitted from this table.

Food Sources of Calcium

Food Sources of Calcium ranked by milligrams of calcium per standard amount; also calories in the standard amount. (All are >- 20% of AI for adults 19-50, which is 1,000 mg/day.)

Food, Standard Amount	Calcium (mg)	Calories
Plain yogurt, non-fat (13 g protein/8 oz), 8-oz container	452	127
Romano cheese, 1.5 oz	452	165
Pasteurized process Swiss cheese, 2 oz	438	190
Plain yogurt, low-fat (12 g protein/8 oz), 8-oz container	415	143
Fruit yogurt, low-fat (10 g protein/8 oz), 8-oz container	345	232
Swiss cheese, 1.5 oz	336	162
Ricotta cheese, part skim, ½ cup	335	170
Pasteurized process American cheese food, 2 oz	323	188
Provolone cheese, 1.5 oz	321	150
Mozzarella cheese, part-skim, 1.5 oz	311	129
Cheddar cheese, 1.5 oz	307	171
Fat-free (skim) milk, 1 cup	306	83
Muenster cheese, 1.5 oz	305	156
1% low-fat milk, 1 cup	290	102
Low-fat chocolate milk (1%), 1 cup	288	158
2% reduced fat milk, 1 cup	285	122
Reduced fat chocolate milk (2%), 1 cup	285	180
Buttermilk, low-fat, 1 cup	284	98
Chocolate milk, 1 cup	280	208
Whole milk, 1 cup	276	146
Yogurt, plain, whole milk (8 g protein/8 oz), 8-oz container	275	138
Ricotta cheese, whole milk, ½ cup	255	214
Blue cheese, 1.5 oz	225	150
Mozzarella cheese, whole milk, 1.5 oz	215	128
Feta cheese, 1.5 oz	210	113

Source: Nutrient values from Agricultural Research Service (ARS) Nutrient Database for Standard Reference, Release 17. Foods are from ARS single nutrient reports, sorted in descending order by nutrient content in terms of common household measures. Food items and weights in the single nutrient reports are adapted from those in 2002 revision of USDA Home and Garden Bulletin No. 72, Nutritive Value of Foods. Mixed dishes and multiple preparations of the same food item have been omitted from this table.

Non-Dairy Food Sources of Calcium

Non-Dairy Food Sources of Calcium ranked by milligrams of calcium per standard amount; also calories in the standard amount. The bioavailability may vary. (The AI for adults is 1,000 mg/day.)[a]

Food, Standard Amount	Calcium (mg)	Calories
Fortified ready-to-eat cereals (various), 1 oz	236-1043	88-106
Soy beverage, calcium fortified, 1 cup	368	98
Sardines, Atlantic, in oil, drained, 3 oz	325	177
Tofu, firm, prepared with nigari[b] , ½ cup	253	88
Pink salmon, canned, with bone, 3 oz	181	118
Collards, cooked from frozen, ½ cup	178	31
Molasses, blackstrap, 1 Tbsp	172	47
Spinach, cooked from frozen, ½ cup	146	30
Soybeans, green, cooked, ½ cup	130	127
Turnip greens, cooked from frozen, ½ cup	124	24
Ocean perch, Atlantic, cooked, 3 oz	116	103
Oatmeal, plain and flavored, instant, fortified, 1 packet prepared	99-110	97-157
Cowpeas, cooked, ½ cup	106	80
White beans, canned, ½ cup	96	153
Kale, cooked from frozen, ½ cup	90	20
Okra, cooked from frozen, ½ cup	88	26
Soybeans, mature, cooked, ½ cup	88	149
Blue crab, canned, 3 oz	86	84
Beet greens, cooked from fresh, ½ cup	82	19
Bok-choi, Chinese cabbage, cooked from fresh, ½ cup	79	10
Clams, canned, 3 oz	78	126
Dandelion greens, cooked from fresh, ½ cup	74	17
Rainbow trout, farmed, cooked, 3 oz	73	144

[a] Both calcium content and bioavailability should be considered when selecting dietary sources of calcium. Some plant foods have calcium that is well absorbed, but the large quantity of plant foods that would be needed to provide as much calcium as in a glass of milk may be unachievable for many. Many other calcium-fortified foods are available, but the percentage of calcium that can be absorbed is unavailable for many of them.

[b] Calcium sulfate and magnesium chloride.

Source: Nutrient values from Agricultural Research Service (ARS) Nutrient Database for Standard Reference, Release 17. Foods are from ARS single nutrient reports, sorted in descending order by nutrient content in terms of common household measures. Food items and weights in the single nutrient reports are adapted from those in 2002 revision of USDA Home and Garden Bulletin No. 72, Nutritive Value of Foods. Mixed dishes and multiple preparations of the same food item have been omitted from this table.

Food Sources of Dietary Fiber

Food Sources of Dietary Fiber ranked by grams of dietary fiber per standard amount; also calories in the standard amount. (All are >-10% of AI for adult women, which is 25 grams/day.)

Food, Standard Amount	Dietary Fiber (g)	Calories
Navy beans, cooked, ½ cup	9.5	128
Bran ready-to-eat cereal (100%), ½ cup	8.8	78
Kidney beans, canned, ½ cup	8.2	109
Split peas, cooked, ½ cup	8.1	116
Lentils, cooked, ½ cup	7.8	115
Black beans, cooked, ½ cup	7.5	114
Pinto beans, cooked, ½ cup	7.7	122
Lima beans, cooked, ½ cup	6.6	108
Artichoke, globe, cooked, 1 each	6.5	60
White beans, canned, ½ cup	6.3	154
Chickpeas, cooked, ½ cup	6.2	135
Great northern beans, cooked, ½ cup	6.2	105
Cowpeas, cooked, ½ cup	5.6	100
Soybeans, mature, cooked, ½ cup	5.2	149
Bran ready-to-eat cereals, various, ~1 oz	2.6-5.0	90-108
Crackers, rye wafers, plain, 2 wafers	5.0	74
Sweet potato, baked, with peel, l medium (146 g)	4.8	131
Asian pear, raw, 1 small	4.4	51
Green peas, cooked, ½ cup	4.4	67
Whole-wheat English muffin, 1 each	4.4	134
Pear, raw, 1 small	4.3	81
Bulgur, cooked, ½ cup	4.1	76
Mixed vegetables, cooked, ½ cup	4.0	59
Raspberries, raw, ½ cup	4.0	32
Sweet potato, boiled, no peel, 1 medium (156 g)	3.9	119
Blackberries, raw, ½ cup	3.8	31

Potato, baked, with skin, 1 medium	3.8	161
Soybeans, green, cooked, ½ cup	3.8	127
Stewed prunes, ½ cup	3.8	133
Figs, dried, ¼ cup	3.7	93
Dates, ¼ cup	3.6	126
Oat bran, raw, ¼ cup	3.6	58
Pumpkin, canned, ½ cup	3.6	42
Spinach, frozen, cooked, ½ cup	3.5	30
Shredded wheat ready-to-eat cereals, various, ~1 oz	2.8-3.4	96
Almonds, 1 oz	3.3	164
Apple with skin, raw, 1 medium	3.3	72
Brussels sprouts, frozen, cooked, ½ cup	3.2	33
Whole-wheat spaghetti, cooked, ½ cup	3.1	87
Banana, 1 medium	3.1	105
Orange, raw, 1 medium	3.1	62
Oat bran muffin, 1 small	3.0	178
Guava, 1 medium	3.0	37
Pearled barley, cooked, ½ cup	3.0	97
Sauerkraut, canned, solids, and liquids, ½ cup	3.0	23
Tomato paste, ¼ cup	2.9	54
Winter squash, cooked, ½ cup	2.9	38
Broccoli, cooked, ½ cup	2.8	26
Parsnips, cooked, chopped, ½ cup	2.8	55
Turnip greens, cooked, ½ cup	2.5	15
Collards, cooked, ½ cup	2.7	25
Okra, frozen, cooked, ½ cup	2.6	26
Peas, edible-podded, cooked, ½ cup	2.5	42

Source: ARS Nutrient Database for Standard Reference, Release 17. Foods are from single nutrient reports, which are sorted either by food description or in descending order by nutrient content in terms of common household measures. The food items and weights in these reports are adapted from those in 2002 revision of USDA Home and Garden Bulletin No. 72, Nutritive Value of Foods. Mixed dishes and multiple preparations of the

Food Sources of Potassium

Food Sources of Potassium ranked by milligrams of potassium per standard amount, also showing calories in the standard amount. (The AI for adults is 4,700 mg/day potassium or 1550 mg/meal)

Food, Standard Amount	Potassium (mg)	Calories
Sweet potato, baked, 1 potato (146 g)	694	131
Tomato paste, ¼ cup	664	54
Beet greens, cooked, ½ cup	655	19
Potato, baked, flesh, 1 potato (156 g)	610	145
White beans, canned, ½ cup	595	153
Yogurt, plain, non-fat, 8-oz container	579	127
Tomato puree, ½ cup	549	48
Clams, canned, 3 oz	534	126
Yogurt, plain, low-fat, 8-oz container	531	143
Prune juice, ¾ cup	530	136
Carrot juice, ¾ cup	517	71
Blackstrap molasses, 1 Tbsp	498	47
Halibut, cooked, 3 oz	490	119
Soybeans, green, cooked, ½ cup	485	127
Tuna, yellow fin, cooked, 3 oz	484	118
Lima beans, cooked, ½ cup	484	104
Winter squash, cooked, ½ cup	448	40
Soybeans, mature, cooked, ½ cup	443	149
Rockfish, Pacific, cooked, 3 oz	442	103
Cod, Pacific, cooked, 3 oz	439	89
Bananas, 1 medium	422	105
Spinach, cooked, ½ cup	419	21
Tomato juice, ¾ cup	417	31
Tomato sauce, ½ cup	405	39
Peaches, dried, uncooked, ¼ cup	398	96
Prunes, stewed, ½ cup	398	133

Milk, non-fat, 1 cup	382	83
Pork chop, center loin, cooked, 3 oz	382	197
Apricots, dried, uncooked, ¼ cup	378	78
Rainbow trout, farmed, cooked, 3 oz	375	144
Pork loin, center rib (roasts), lean, roasted, 3 oz	371	190
Buttermilk, cultured, low-fat, 1 cup	370	98
Cantaloupe, ¼ medium	368	47
1%-2% milk, 1 cup	366	102-122
Honeydew melon, 1/8 medium	365	58
Lentils, cooked, ½ cup	365	115
Plantains, cooked, ½ cup slices	358	90
Kidney beans, cooked, ½ cup	358	112
Orange juice, ¾ cup	355	85
Split peas, cooked, ½ cup	355	116
Yogurt, plain, whole milk, 8 oz container	352	138

Source: Nutrient values from Agricultural Research Service (ARS) Nutrient Database for Standard Reference, Release 17. Foods are from ARS single nutrient reports, sorted in descending order by nutrient content in terms of common household measures. Food items and weights in the single nutrient reports are adapted from those in 2002 revision of USDA Home and Garden Bulletin No. 72, Nutritive Value of Foods. Mixed dishes and multiple preparations of the same food item have been omitted from this table.

Food Sources of Magnesium

Food Sources of Magnesium ranked by milligrams of magnesium per standard amount; also calories in the standard amount. (All are >- 10% of RDA for adult men, which is 420 mg/day.)

Food, Standard Amount	Magnesium (mg)	Calories
Pumpkin and squash seed kernels, roasted, 1 oz	151	148
Brazil nuts, 1 oz	107	186
Bran ready-to-eat cereal (100%), ~1 oz	103	74
Halibut, cooked, 3 oz	91	119
Quinoa, dry, ¼ cup	89	159
Spinach, canned, ½ cup	81	25
Almonds, 1 oz	78	164
Spinach, cooked from fresh, ½ cup	78	20
Buckwheat flour, ¼ cup	75	101
Cashews, dry roasted, 1 oz	74	163
Soybeans, mature, cooked, ½ cup	74	149
Pine nuts, dried, 1 oz	71	191
Mixed nuts, oil roasted, with peanuts, 1 oz	67	175
White beans, canned, ½ cup	67	154
Pollock, walleye, cooked, 3 oz	62	96
Black beans, cooked, ½ cup	60	114
Bulgur, dry, ¼ cup	57	120
Oat bran, raw, ¼ cup	55	58
Soybeans, green, cooked, ½ cup	54	127
Tuna, yellowfin, cooked, 3 oz	54	118
Artichokes (hearts), cooked, ½ cup	50	42
Peanuts, dry roasted, 1 oz	50	166
Lima beans, baby, cooked from frozen, ½ cup	50	95
Beet greens, cooked, ½ cup	49	19
Navy beans, cooked, ½ cup	48	127
Tofu, firm, prepared with nigari[a] , ½ cup	47	88

Okra, cooked from frozen, ½ cup	47	26
Soy beverage, 1 cup	47	127
Cowpeas, cooked, ½ cup	46	100
Hazelnuts, 1 oz	46	178
Oat bran muffin, 1 oz	45	77
Great northern beans, cooked, ½ cup	44	104
Oat bran, cooked, ½ cup	44	44
Buckwheat groats, roasted, cooked, ½ cup	43	78
Brown rice, cooked, ½ cup	42	108
Haddock, cooked, 3 oz	42	95

[a] Calcium sulfate and magnesium chloride.

Source: Nutrient values from Agricultural Research Service (ARS) Nutrient Database for Standard Reference, Release 17. Foods are from ARS single nutrient reports, sorted in descending order by nutrient content in terms of common household measures. Food items and weights in the single nutrient reports are adapted from those in 2002 revision of USDA Home and Garden Bulletin No. 72, Nutritive Value of Foods. Mixed dishes and multiple preparations of the same food item have been omitted from this table.